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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,085	09/09/2003	Rene Perrot	CS-21,376	9162

27182 7590 12/20/2004

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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 12/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/657,085

Applicant(s)

PERROT ET AL.

Examiner

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9-9-03</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (U.S. Pat. 6,599,405) in view of Hunt et al. (U.S. Pat. 5,674,367).

Regarding Applicant's claims 1, 9 and 14, Hunt et al. '405 teach a method of manufacturing a sputter target assembly (See Abstract) comprising the steps of manufacturing a backing plate (Column 1 lines 61-62), the backing plate having a cylindrical recess having a depth and a diameter and a yield strength less than the yield strength of a target insert. (Column 1 lines 61-66) The backing plate has a planar top surface. (See Fig. 1) A target insert is manufactured. (Column 1 lines 59) The target

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insert has a conical-shaped rear surface. (Column 2 lines 30-31) The target has a rear surface that corresponds with the cylindrical recess of the backing plate. (Column 1 lines 62-64) The target has a yield strength greater than that of the backing plate. (Column 3 lines 4-6) The recess of the backing plate has a depth that is less than the height of the target. (Column 1 lines 62-64) The target insert is hot pressed into the cylindrical recess so that the backing plate material reaches a state of plastic deformation that facilitates forming strong solid state bonds. It is advantageous to diffuse and react the materials together to form reaction products that contribute to the bond strength. (Column 3 lines 21-32)

Regarding Applicant's Claims 2 and 9, Hunt et al. '405 teach at least fifty percent of the frusta-conical rear surface bonds to the backing plate. (Column 3 lines 49-51)

Regarding Applicant's Claim 3, Hunt et al. '405 the target insert and backing plate are maintained at a temperature of above 200 degrees C for at least one hour to improve bonding. (Column 2 lines 60-62)

Regarding Applicant's Claim 4, Hunt et al. '405 pressing the target into near final shape includes utilizing powder. (Column 2 lines 56-59)

Regarding Applicant's Claim 5, Hunt et al. '405 the volume of the recess of the backing plate has a volume that is at least ninety percent of the volume of the tapered insert. (Column 3 lines 11-14)

Regarding Applicant's Claim 6, Hunt et al. '405 teach the backing plate recess can have a volume that is approximately equal to the tapered target insert's volume. (Column 3 lines 18-20)

Regarding Applicant's Claim 8, Hunt et al. '405 teach the cylindrical recess is disposed in a portion of the planar top surface of the backing plate. (See Fig. 1)

Regarding Applicant's Claims 10 and 15, Hunt et al. '405 teach the recess having a shape conformed to the shape of the target insert. (Column 6 lines 36-38)

Regarding Applicant's Claims 11 and 16, Hunt et al. '405 teach the reaction product between the target insert and the backing plate bonds the target insert to the backing plate. (Column 3 lines 30-32)

Regarding Applicant's Claims 12 and 17, Hunt et al. '405 teach a frustum and a conical interface bonds the target insert to the backing plate. (Column 6 lines 42-44)

Regarding Applicant's Claim 14, Hunt et al. '405 teach the conical interface consists of at least about sixty percent of the total bond surface area of the target insert. (Column 3 lines 51-53)

The differences between Hunt et al. '405 and the present claims is that the target insert protruding above the planar front surface of the backing plate is not discussed (Claim 1, 9,18) and the front surface of the target has a frusta-conical configuration is not discussed (Claims 7,13, 14).

Hunt et al. '367 teach a circular target. (Column 3 lines 4-6) The target front surface can be frusta-conical. (Figure 7) The target front surface extends above the target backing plate. (Figure 7)

The motivation for utilizing a target that is frusta-conical and extends above the surface of the backing plate is that it allows for utilizing thicker targets. (Column 2 lines 6-8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Hunt et al. '405 by utilizing a target insert that protrudes above the planar front surface of the backing plate and a front surface that has a frusta-conical configuration as taught by Hunt et al. '367 because it allows for utilizing thicker targets.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-18 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 6,599,405 in view of Hunt et al. (U.S. Pat. 5,674,367).

Claims 1-12 of U.S. Pat. No. 6,599,405 teach a method of manufacturing a sputter target assembly comprising the steps of: a) pressing a target insert having a near final shape into a backing plate, the target insert having a yield strength, a diameter, a height, a planar top surface and a frusta-conical rear surface; b) providing a backing plate, the backing plate having a cylindrical recess corresponding to the

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diameter of the target insert, the cylindrical recess having a depth less than the height of the target insert and a yield strength less than the yield strength of the target insert; and c) hot pressing the target insert into the cylindrical recess of the backing plate to a state of plastic deformation so as to diffusion bond the target insert to the cylindrical recess of the backing plate to form the target assembly, the target assembly containing the target insert with the frusta-conical rear surface. The method includes wherein at least fifty percent of the frusta-conical rear surface bonds to the backing plate. The method includes the additional step of maintaining temperature of the target insert and backing plate above 200 degree C. for at least one hour to improve bonding between the frusta-conical rear surface of the target insert and the backing plate. The method includes wherein the pressing of the target into near final shape includes a powder product as the target insert. The method includes wherein the cylindrical recess has a volume and the target insert has a volume; and the cylindrical recess has a volume equal to or less than the volume of the target insert. The method includes wherein the cylindrical recess has a volume and the target insert has a volume; and the cylindrical recess has a volume approximately equal to the volume of the target insert. (Column 5 lines 19-46; Column 6 lines 1-8)

A sputter target assembly comprising: a cylindrical backing plate, the cylindrical backing plate having a planar front surface and a recess within the front surface; and a target insert bonded to the backing plate within the recess of the backing plate, the target insert having a planar front surface and a rear surface, the rear surface having at least about fifty percent of its surface area conical-shaped and the rear surface being

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bonded to the backing plate to secure the target insert to the backing plate, wherein the recess is plastically deformed to the shape of the target insert, to form the target assembly. The sputter target of wherein a resultant product between the target insert and the backing plate bonds the target insert to the backing plate. The sputter target has a conical interface is formed which bonds the target insert to the backing plate. A sputter target assembly comprising: a cylindrical backing plate, the cylindrical backing plate having a planar front surface and a recess within the front surface; and a target insert bonded to the backing plate within the recess of the backing plate, the target insert having a planar front surface and a frusta-conical shaped rear surface, the rear surface having at least about sixty percent of its surface area conical-shaped and the rear surface being bonded to the backing plate to secure the target insert to the backing plate, wherein the recess is plastically deformed to the shape of the target insert, to form the target assembly. The sputter target wherein a reaction product between the target insert and the backing plate bonds the target insert to the backing plate. The sputter target wherein a frustum interface and a conical interface bond the target insert to the backing plate. (Column 6 lines 9-44)

The difference between U.S. Pat. 6,599,405 and the present claims is that the target insert protruding above the planar front surface of the backing plate is not discussed (Claim 1, 9,18) and the front surface of the target has a frusta-conical configuration is not discussed (Claims 7,13, 14).

Hunt et al. '367 teach a circular target. (Column 3 lines 4-6) The target front surface can be frusta-conical. (Figure 7) The target front surface extends above the target backing plate. (Figure 7)

The motivation for utilizing a target that is frusta-conical and extends above the surface of the backing plate is that it allows for utilizing thicker targets. (Column 2 lines 6-8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified U.S. Pat. 6,599,405 by utilizing a target insert that protrudes above the planar front surface of the backing plate and a front surface that has a frusta-conical configuration as taught by Hunt et al. '367 because it allows for utilizing thicker targets.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
December 13, 2004